C-AD

Radiation

Safety

Committee

Issued: September 4, 2015

Minutes of RSC Subcommittee of August 31, 2015

Subject: Commissioning and Operation of the X-band System at ATF

Present: M. Fedurin, K. Kusche, and D. Beavis

A small group got together to discuss preparing for commissioning of the x-band cavity in beam line two of ATF. The waveguide installation is nearing completion and preparations for commissioning the waveguide and then the cavity are needed. There are several issues that need to be addressed for the commissioning and operations of the system:

- The waveguide can generate x-rays during the commission process.
  - The x-rays are typically generated in regions of poor vacuum.
  - The locations could be anywhere from the Klystron to the cavity
  - Mikhail will try to provide guidance on the x-ray generation along the waveguide
  - To protect the Klystron the damage during discharges (x-ray generation) the conditioning is conducted in a slow and methodical manner. This protects the equipment and also limits the x-ray generation which could cause exposure to personnel.
- One to two months may be required for conditioning the wave guide.
  - During that time the cavity will not be driven by the RF wave due to the presence of valves near the cavity. This will prevent the cavity from being an x-ray source during the waveguide conditioning.
  - It is expected that other users will be using the facility for experiments. Either the conditioning will occur simultaneously or the commissioning will need to be conducted after experiment operations have ceased for the day.
- Cavity conditioning
  - The cavity conditioning is expected to require less time than the waveguide
  - Mikhail will estimate the expected maximum x-ray energy from the cavity and see if he can provide guidance on the x-ray intensity.
  - If the x-rays have sufficiently high energy then a chipmunk can be used to monitor the x-ray levels.
  - Protecting personnel from the cavity x-rays via interlocks or shielding still needs to be investigated. Local shielding may have issues with x-rays leaking out the beam pipe pathways. Requiring the area to be secure may interfere with other users trying to utilize the experimental area.
- X-band Operation
  - The x-band cavity will be located in beam line two approximately where the last 20 degree bend is located.
  - The beam line will become 50-100cm longer.
  - The 20 degree bend will be in the opposite direction.

- The shielding in the northwest corner will need to be modified. Shield blocks that can be lifted by a forklift would be desirable.
- The shielding near the equipment door may also require improvement.
- The x-band is expected to operate for the duration of ATF and will be relocated to ATFII in the future in the experimental halls.

The following items need to be completed:
(ATS-ATF-9/30/15-Fedurin & Beavis) Review plan for commissioning the waveguide and prevent exposure to possible x-ray generation.

(ATS-ATF-10/30/15-Fedurin & Beavis) Review plan for x-band cavity commissioning the method to prevent exposure to x-rays.

ATS-ATF-10/30/15-Kusche & Beavis) Review beamlines changes and associate shielding changes. Include the consideration of beam fault studies.

CC:

RSC
Present
T. Blydenburgh
D. Passarello